

CLAIMS:

*Sub At*  
*3/10/84*

5. 1. A superconducting ceramic of the general formula



in which  $0.1 \leq x < 1$

$$\underline{y} = 2.0-4.0$$

$$\underline{z} = 1.0-4.0$$

$$\underline{w} = 4.0-10.0$$

A is one or more rare earth elements and

B is more than one alkaline earth element  
 when A is one rare earth element, and is one  
 or more alkaline earth elements when A is  
 more than one rare earth element.

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2. A superconducting ceramic according to claim 1, in  
 which

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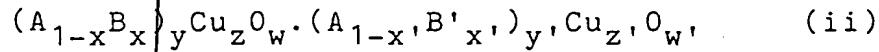
$$\underline{y} = 2.5-3.5$$

$$\underline{z} = 1.5-3.5 \text{ and}$$

$$\underline{w} = 6.0-8.0.$$

*Priority*  
*7/8*  
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*7/8*

*Sub A2*  
3. A superconducting ceramic according to claim 1 of the general formula



in which  $0.1 \leq \underline{x} \leq 1$

5  $0.1 \leq \underline{x'} \leq 1$

$$\underline{y} = 2.0-4.0,$$

$$\underline{y'} = 2.0-4.0,$$

$$\underline{z} = 1.0-4.0,$$

$$\underline{z'} = 1.0-4.0,$$

10  $\underline{w} = 4.0-10.0,$

$$\underline{w'} = 4.0-10.0,$$

A is one or more rare earth elements and

B and B' are two or more alkaline earth elements.

15 4. A superconducting ceramic according to claim 3, in which

$$\underline{y} = 2.5-3.5$$

$$\underline{y'} = 2.5-3.5$$

$$\underline{z} = 1.5-3.5$$

20  $\underline{z'} = 1.5-3.5$

$$\underline{w} = 6.0-8.0 \text{ and}$$

$$\underline{w'} = 6.0-8.0.$$

5. A superconducting ceramic according to claim 3 or  
claim 4, in which A is one rare earth element.

6. A superconducting ceramic according to claim 5,  
having the stoichiometric formula  $\text{YbBaSrCu}_3\text{O}_{6-8}$ .

5 7. A superconducting ceramic according to claim 5,  
having the stoichiometric formula  $\text{YBaCaCu}_3\text{O}_{6-8}$ .

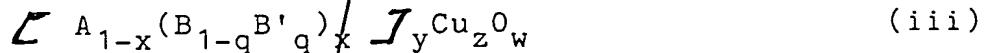
8. A superconducting ceramic according to claim 5,  
having the stoichiometric formula  
10  $\text{YbBa}_{0.7}\text{Sr}_{0.6}\text{Ca}_{0.6}\text{Cu}_3\text{O}_{6-8}$ .

9. A superconducting ceramic according to claim 3 or  
claim 4, in which A is more than one rare earth  
element.

10. A superconducting ceramic according to claim 9,  
15 having the stoichiometric formula  
 $\text{Y}_{0.5}\text{Yb}_{0.5}\text{BaSrCu}_3\text{O}_{6-8}$ .

11. A superconducting ceramic according to claim 9,  
having the stoichiometric formula  
 $\text{Y}_{0.5}\text{Yb}_{0.5}\text{BaCaCu}_3\text{O}_{6-8}$ .

12. A superconducting ceramic according to claim 1, of the general formula



in which  $0.1 \leq \underline{x} < 1$

5  $0 < \underline{q} < 1$

$\underline{y} = 2.0-4.0$ ,

$\underline{z} = 1.0-4.0$ ,

$\underline{w} = 4.0-10.0$ ,

A is a rare earth element and

10 B and B' are different alkaline earth elements.

*Sub B2*  
13. A superconducting ceramic according to claim 12,

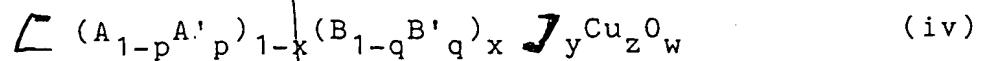
in which

$\underline{y} = 2.5-3.5$

15  $\underline{z} = 1.5-3.5$  and

$\underline{w} = 6.0-8.0$ .

14. A superconducting ceramic according to claim 1, of the general formula



in which  $0.1 \leq x \leq 1$

$$0 < p < 1$$

$$0 < q < 1$$

$$y = 2.0-4.0,$$

$$z = 1.0-4.0,$$

$$w = 4.0-10.0,$$

A and A' are different rare earth elements

and

10 B and B' are different alkaline earth elements.

*Sub B3* 15. A superconducting ceramic according to claim 14,

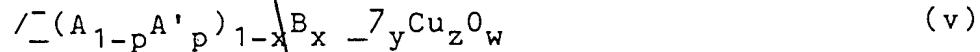
in which

$$y = 2.5-3.5$$

$$z = 1.5-3.5$$

$$w = 6.0-8.0.$$

*Sub B3* 16. A superconducting ceramic according to claim 1, of  
the general formula



in which

$$0.1 \leq \underline{x} < 1$$

$$0 < \underline{p} < 1$$

5  $\underline{y} = 2.0-4.0,$

$$\underline{z} = 1.0-4.0,$$

$$\underline{w} = 4.0-10.0,$$

A and A' are different rare earth elements  
and

10 B is an alkaline earth element.

17. A superconducting ceramic according to claim 16,

in which

$$\underline{y} = 2.5-3.5$$

$$\underline{z} = 1.5-3.5$$

15  $\underline{w} = 6.0-8.0.$

18. A superconducting ceramic according to claim 17,

having the stoichiometric formula  $\text{Y}_{0.5}\text{Gd}_{0.5}\text{Ba}_2\text{Cu}_3\text{O}_{6-8}.$

19. A superconducting ceramic according to claim 17,

having the stoichiometric formula  $\text{Y}_{0.5}\text{Yb}_{0.5}\text{Ba}_2\text{Cu}_3\text{O}_{6-8}.$

20. A method for producing a superconducting ceramic

according to any one of claims 1 to 19, which comprises

mixing together stoichiometric amounts of the oxides and/or carbides of the constituent metals, in powder form, compressing the mixture to a desired shape and sintering the mixture at an elevated temperature.

5 21. A superconducting ceramic comprising two or more rare earth elements and/or two or more alkaline earth elements and having a polycrystalline perovskite-like structure of large crystalline particles providing reduced interfacial areas between crystalline particles  
10 and correspondingly elevated superconducting onset temperature.